

Application No.: 10/632643
 Docket No.: CL2037USCIP

Page 2

Listing of Claims

1-10. (Canceled)

11. (Original) A process for preparing an organic composition characterized by an absorbance/micrometer of < 1 at wavelengths from 140 to 260 nm, comprising subjecting to treatment with one or more means for extracting one or more photochemically active species, a compound selected from the group consisting of:

- i) cyclic, linear, or branched hydrofluorocarbons having 2 to 10 carbon atoms in which there are more fluorines than hydrogen, no runs of adjacent C-H bonds longer than two (CH-CH), no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no -CH₂CH₃ radicals;
- ii) X-Rfa[ORfb]_nORfcY wherein X and Y can be hydrogen or fluorine and Rfa, Rfb, and Rfc are 1 to 3 carbon fluorocarbon radicals, linear or branched

in which there are more fluorines than hydrogens, no runs of adjacent C-H bonds longer than two are present, no -CH₂CH₃ radicals are present and no sequences with hydrogen on both sides of an ether oxygen (CH-O-CH) are present;

- iii) C_nF_{2n-v}+2Hv wherein $n = 2$ to 10, $v < n+1$, no runs of adjacent C-H bonds longer than two are present, no runs of adjacent C-F bonds longer than 6 are present, and no CH₂CH₃ radicals are present;
- iv) C_nF_{2n+1}CFHCFHCmF_{2m+1} where n equals 1 to 4; and m equals 1 to 4;
- v) CF₃CH₂CF₂CH₃;
- vi) F[CF(CF₃)CF₂O]_nCFHCF₃ where $n = 1$ to 5;
- vii) F[CF(CF₃)CF₂O]_nCF₂CF₃ where $n = 1$ to 5;
- viii) HCF₂(OCF₂)_n(OCF₂CF₂)_mOCF₂H where $n + m = 1$ to 8,;
- ix) cyclic, linear, or branched hydrofluorocarbon amines and ether-amines in which there are more fluorines than hydrogens, no runs of hydrogen longer than two (CH-CH), no -CH₂CH₃ radicals are present and no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no C-H bonds immediately adjacent to either nitrogen or oxygen;

and,

- x) XRfa(ORfb)_w(ORfc)_x(ORfd)_yORfeY
 where X = H or F; Rfa and Rfe are independently a linear or branched fluoroalkyl radical of 1 to 3 carbons; Rfb, Rfc, and Rfd are linear or branched fluoroalkenyl radicals of 1-3 carbons; and w, x, and y = 0 to 10 with the proviso that $w+x+y > 2$;

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 3

at least until the desired concentration of said one or more photochemically active species is achieved.

12. (Currently amended) The process of Claim 11 wherein said one or more photochemically active species comprises moisture and oxygen and the desired concentrations are below 20 parts per million and below 90 parts per million, respectively.

13. (Currently amended) The process of Claim 11 wherein said ~~one or more compounds~~ are compound is selected from the group consisting of $C_nF_{2n+1}CFHCFHCmF_{2m+1}$ where n equals 1 to 4; and m equals 1 to 4 and $HCF_2(OCF_2)_n(OCF_2CF_2)_mOCF_2H$ where $n + m = 1$ to 8.

14. (Currently amended) The process of Claim 13 wherein said ~~one or more compounds~~ are compound is selected from the group consisting of $CF_3CFHCFHCF_2CF_3$, $CF_3CH_2CF_2CH_3$ and $HCF_2O(CF_2O)_n(CF_2CF_2O)_mCF_2H$ where $n+m=2$ to 6.

15. (Currently amended) The process of Claim 11 wherein said ~~one or more compounds~~ are compound is selected from the group of fluoroethers consisting of a cyclic perfluoroaminoethers comprising one or more linear perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; an acyclic perfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; and, an acyclic hydrofluorocarbonfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons and wherein said acyclic hydrofluorocarbonfluoroether there are no geminal or adjacent hydrogens.

16. (Original) The process of Claim 15 wherein the water vapor and oxygen concentrations are each less than 5 parts per million by weight of the fluoroether.

17. (Original) The process of Claim 16 wherein the water vapor and oxygen concentrations are each less than 1 part per million by weight of the fluoroether.

18. (Original) The process of Claims 15, 16 or 17 wherein said one or more compounds is perfluoro-N-methylmorpholine.

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 4

19. (Original) The process of Claims 15, 16, or 17 wherein said one or more compounds is $\text{CF}_3(\text{CF}_2)_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCF}_2\text{CF}_3$, $\text{CF}_3\text{O}(\text{CF}_2)_n\text{OCF}_3$ where n is 3 to 5, or $\text{CF}_3\text{O}(\text{CF}_2)_x\text{CF}_2\text{CF}_2\text{O}(\text{CF}_2\text{O})_y\text{CF}_3$ where x and y independently are 2 or 3.

20. (Original) The process of Claims 15, 16, or 17 wherein said one or more compounds is $\text{CF}_3\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCFHCF}_3$ or $\text{CF}_3\text{O}(\text{CF}_2\text{O})_n\text{CF}_2\text{H}$ wherein $n = 3$ to 5.

21. (Original) The process of Claim 11 wherein at least one of said one or more compounds is a liquid.

22. (Original) The process of Claim 12 wherein said means comprises subjecting said compound to freeze-thaw fractional distillation and contacting said compound with molecular sieves.

23. (Original) The process of Claim 1 wherein said means comprises sparging with an inert gas.

24. (Original) The process of Claim 12 wherein said means comprises contacting said compound with molecular sieves and sparging said compound with an inert gas.

25. (Original) A process for forming an optical image on a substrate, the process comprising:

- a) radiating electromagnetic radiation from source capable of radiating electromagnetic radiation in the range of 140 260 nm;
- b) receiving said radiation on a target disposed to receive at least a portion of said radiation; and

causing at least a portion of said radiation to traverse one or more optically transparent compositions disposed between said radiation source and said target, at least one of said optically transparent compositions comprising a composition comprising less than 20 parts per million of water, less than 90 parts per million of oxygen, and one or more compounds selected from the group consisting of:

- i) cyclic, linear, or branched hydrofluorocarbons having 2 to 10 carbon atoms in which there are more fluorines than hydrogen, no runs of adjacent C-H bonds longer than two (CH-CH), no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no $-\text{CH}_2\text{CH}_3$ radicals;

Application No.: 10/632643
 Docket No.: CL2037USCIP

Page 5

- ii) $X-R_{fa}[OR_{fb}]_nOR_{fc}Y$ wherein X and Y can be hydrogen or fluorine and R_{fa} , R_{fb} , and R_{fc} are 1 to 3 carbon fluorocarbon radicals, linear or branched
 in which there are more fluorines than hydrogens, no runs of adjacent C-H bonds longer than two are present, no $-CH_2CH_3$ radicals are present and no sequences with hydrogen on both sides of an ether oxygen (CH-O-CH) are present;
 - iii) $C_nF_{2n-v+2}H_v$ wherein $n = 2$ to 10, $v < n+1$, no runs of adjacent C-H bonds longer than two are present, no runs of adjacent C-F bonds longer than 6 are present, and no CH_2CH_3 radicals are present;
 - iv) $C_nF_{2n+1}CFHCFHC_mF_{2m+1}$ where n equals 1 to 4; and m equals 1 to 4;
 - v) $CF_3CH_2CF_2CH_3$;
 - vi) $F[CF(CF_3)CF_2O]_nCFHCF_3$ where $n = 1$ to 5;
 - vii) $F[CF(CF_3)CF_2O]_nCF_2CF_3$ where $n = 1$ to 5;
 - viii) $HCF_2(OCF_2)_n(OCF_2CF_2)_mOCF_2H$ where $n + m = 1$ to 8;.
 - ix) cyclic, linear, or branched hydrofluorocarbon amines and ether-amines in which there are more fluorines than hydrogens, no runs of hydrogen longer than two (CH-CH), no $-CH_2CH_3$ radicals are present and no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no C-H bonds immediately adjacent to either nitrogen or oxygen;
- and,
- x) $XR_{fa}(OR_{fb})_w(OR_{fc})_x(OR_{fd})_yOR_{fe}Y$
 where X = H or F; R_{fa} and R_{fe} are independently a linear or branched fluoroalkyl radical of 1 to 3 carbons; R_{fb} , R_{fc} , and R_{fd} are linear or branched fluoroalkenyl radicals of 1-3 carbons; and w, x, and y = 0 to 10 with the proviso that $w+x+y > 2$.

26. (Original) The process of Claim 25 wherein said one or more compounds are selected from the group consisting of $C_nF_{2n+1}CFHCFHC_mF_{2m+1}$ where n equals 1 to 4; and m equals 1 to 4 and $HCF_2(OCF_2)_n(OCF_2CF_2)_mOCF_2H$ where $n + m = 1$ to 8.

27. (Original) The process of Claim 26 wherein said one or more compounds are selected from the group consisting of $CF_3CFHCFHCF_2CF_3$, $CF_3CH_2CF_2CH_3$ and $HCF_2O(CF_2O)_n(CF_2CF_2O)_mCF_2H$ where $n+m=2$ to 6.

28. (Original) The process of Claim 25 wherein said one or more compounds are selected from the group of fluoroethers consisting of a cyclic perfluoroaminoethers comprising one or more linear perfluoroalkyl radicals,

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 6

perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; an acyclic perfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; and, an acyclic hydrofluorocarbonfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons and wherein said acyclic hydrofluorocarbonfluoroether there are no geminal or adjacent hydrogens.

29. (Original) The process of Claim 28 wherein the water vapor and oxygen concentrations are each less than 5 parts per million by weight of the fluoroether.

30. (Original) The process of Claim 29 wherein the water vapor and oxygen concentrations are each less than 1 part per million by weight of the fluoroether.

31. (Original) The process of Claims 28, 29, or 30 wherein said one or more compounds is perfluoro-N-methylmorpholine.

32. (Original) The process of Claims 28, 29, or 30 wherein said one or more compounds is $\text{CF}_3(\text{CF}_2)_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCF}_2\text{CF}_3$, $\text{CF}_3\text{O}(\text{CF}_2)_n\text{OCF}_3$ where n is 3 to 5, or $\text{CF}_3\text{O}(\text{CF}_2)_x\text{CF}_2\text{CF}_2\text{O}(\text{CF}_2\text{O})_y\text{CF}_3$ where x and y independently are 2 or 3.

33. (Original) The process of Claims 28, 29, or 30 wherein said one or more compounds is $\text{CF}_3\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCFHCF}_3$ or $\text{CF}_3\text{O}(\text{CF}_2\text{O})_n\text{CF}_2\text{H}$ wherein $n = 3$ to 5.

34. (Original) The process of Claim 25 wherein at least one of said one or more compounds is a liquid.

35. (Currently amended) The process of ~~Claims Claim 25, 28, 29, 30, 31, 32, or 33~~ wherein said at least one of said radiation source and said target are immersed in said optically transparent composition.

36. (Currently amended) The process of ~~Claims Claim 25, 28, 29, 30, 31, 32, or 33~~ wherein both radiation source and target are immersed in said optically transparent composition.

37. (Original) A process for forming an optical image on a substrate, the process comprising:

Application No.: 10/632643
 Docket No.: CL2037USCIP

Page 7

radiating electromagnetic radiation from a source capable of radiating electromagnetic radiation in the range of 140 260 nm;

receiving said radiation on a target disposed to receive at least a portion of said radiation; and

wherein one or more optically transparent compositions is disposed between said radiation source and said target, at least one of said optically transparent compositions comprising a composition treated with one or more means for extracting one or more photochemically active species, the composition comprising one or more compounds selected from the group consisting of:

- i) cyclic, linear, or branched hydrofluorocarbons having 2 to 10 carbon atoms in which there are more fluorines than hydrogen, no runs of adjacent C-H bonds longer than two (CH-CH), no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no -CH₂CH₃ radicals;
- ii) X-R_{fa}[OR_{fb}]_nOR_{fc}Y wherein X and Y can be hydrogen or fluorine and R_{fa}, R_{fb}, and R_{fc} are 1 to 3 carbon fluorocarbon radicals, linear or branched

in which there are more fluorines than hydrogens, no runs of adjacent C-H bonds longer than two are present, no -CH₂CH₃ radicals are present and no sequences with hydrogen on both sides of an ether oxygen (CH-O-CH) are present;

- iii) C_nF_{2n-y+2Hv} wherein n = 2 to 10, v < n+1, no runs of adjacent C H bonds longer than two are present, no runs of adjacent C F bonds longer than 6 are present, and no CH₂CH₃ radicals are present;
- iv) C_nF_{2n+1}CFHCFHC_mF_{2m+1} where n equals 1 to 4; and m equals 1 to 4;
- v) CF₃CH₂CF₂CH₃;
- vi) F[CF(CF₃)CF₂O]_nCFHCF₃ where n = 1 to 5;
- vii) F[CF(CF₃)CF₂O]_nCF₂CF₃ where n = 1 to 5;
- viii) HCF₂(OCF₂)_n(OCF₂CF₂)_mOCF₂H where n + m = 1 to 8;
- ix) cyclic, linear, or branched hydrofluorocarbon amines and ether-amines in which there are more fluorines than hydrogens, no runs of hydrogen longer than two (CH-CH), no -CH₂CH₃ radicals are present and no runs of adjacent C-F bonds longer than 6 (CF-CF-CF-CF-CF-CF), and no C-H bonds immediately adjacent to either nitrogen or oxygen;

and,

- x) XR_{fa}(OR_{fb})_w(OR_{fc})_x(OR_{fd})_yOR_{fe}Y
 where X = H or F; R_{fa} and R_{fe} are independently a linear or branched fluoroalkyl radical of 1 to 3 carbons; R_{fb}, R_{fc}, and R_{fd} are linear or

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 8

branched fluoroalkenyl radicals of 1-3 carbons; and w, x, and y = 0 to 10 with the proviso that $w+x+y > 2$.

38. (Original) The process of Claim 37 wherein the one or more photochemically active species comprise moisture and oxygen and the desired concentrations are below 20 parts per million and below 90 parts per million, respectively.

39. (Original) The process of Claim 37 wherein said one or more compounds are selected from the group consisting of $C_nF_{2n+1}CFHCFHCF_mF_{2m+1}$ where n equals 1 to 4; and m equals 1 to 4 and $HCF_2(OCF_2)_n(OCF_2CF_2)_mOCF_2H$ where $n + m = 1$ to 8.

40. (Original) The process of Claim 39 wherein said one or more compounds are selected from the group consisting of $CF_3CFHCFHCF_2CF_3$, $CF_3CH_2CF_2CH_3$ and $HCF_2O(CF_2O)_n(CF_2CF_2O)_mCF_2H$ where $n+m=2$ to 6.

41. (Original) The process of Claim 37 wherein said one or more compounds are selected from the group of fluoroethers consisting of a cyclic perfluoroaminoethers comprising one or more linear perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; an acyclic perfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; and, an acyclic hydrofluorocarbonfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons and wherein said acyclic hydrofluorocarbonfluoroether there are no geminal or adjacent hydrogens.

42. (Original) The process of Claim 41 wherein the water vapor and oxygen concentrations are each less than 5 parts per million by weight of the fluoroether.

43. (Original) The process of Claim 42 wherein the water vapor and oxygen concentrations are each less than 1 part per million by weight of the fluoroether.

44. (Original) The process of Claims 41, 42, or 43 wherein said one or more compounds is perfluoro-N-methylmorpholine.

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 9

45. (Original) The process of Claims 41, 42, or 43 wherein said one or more compounds is $\text{CF}_3(\text{CF}_2)_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCF}_2\text{CF}_3$, $\text{CF}_3\text{O}(\text{CF}_2)_n\text{OCF}_3$ where n is 3 to 5, or $\text{CF}_3\text{O}(\text{CF}_2)_x\text{CF}_2\text{CF}_2\text{O}(\text{CF}_2\text{O})_y\text{CF}_3$ where x and y independently are 2 or 3.

46. (Original) The process of Claims 41, 42, or 43 wherein said one or more compounds is $\text{CF}_3\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{CF}_2\text{OCFHCF}_3$ or $\text{CF}_3\text{O}(\text{CF}_2)_n\text{CF}_2\text{H}$ wherein $n = 3$ to 5.

47. (Original) The process of Claim 37 wherein at least one of said one or more compounds is a liquid.

48. (Original) The process of Claim 38 wherein said means comprises subjecting said compound to freeze-thaw fractional distillation and contacting said compound with molecular sieves.

49. (Original) The process of Claim 38 wherein said means comprises sparging with an inert gas.

50. (Original) The process of Claim 39 wherein said means comprises contacting said compound with molecular sieves and sparging said compound with an inert gas.

51. (Currently amended) The process of ~~Claims~~ Claim 37, ~~41, 42, 43, 44, 45, or 46~~ wherein said at least one of said radiation source and said target are immersed in said optically transparent composition.

52. (Currently amended) The process of ~~Claims~~ Claim 37, ~~41, 42, 43, 44, 45, or 46~~ wherein both radiation source and target are immersed in said optically transparent composition.

53. (Original) A process for forming an optical image on a substrate, the process comprising:
radiating electromagnetic radiation from a source capable of radiating electromagnetic radiation in the range of 140 260 nm; receiving said radiation on a target disposed to receive at least a portion of said radiation; and wherein at least one of said target or said source is immersed in one or more optically transparent fluorinated organic liquids characterized by an absorbance per centimeter of < 5 disposed between said radiation source and said target, at least one of said optically

Application No.: 10/632643
Docket No.: CL2037USCIP

Page 10

transparent fluorinated organic compounds having been subject to treatment with one or more means for extracting one or more photochemically active species.

54. (Original) The process of Claim 53 wherein said one or more photochemically active species comprises moisture and oxygen and the concentrations are below 5 parts per million each.

55. (Original) The process of Claim 54 wherein the concentrations are below 1 part per million each.

56. (Original) The process of Claims 54 or 55 wherein said optically transparent fluorinated liquid is selected from the group of fluoroethers consisting of a cyclic perfluoroaminoethers comprising one or more linear perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; an acyclic perfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons; and, an acyclic hydrofluorocarbonfluoroether having linear or branched perfluoroalkyl radicals, perfluoroalkenyl radicals, or a combination thereof, said radicals having 1 to 6 carbons and wherein said acyclic hydrofluorocarbonfluoroether there are no geminal or adjacent hydrogens.

57-60. (Canceled)